PHILADELPHIA MEDICAL TIMES.

PHILADELPHIA, MAY 27, 1876.

ORIGINAL COMMUNICATIONS.

THE THERAPEUTICAL VALUE OF THE SPRINGS IN THE NATIONAL PARK, WYOMING TERRITORY.

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THE reservation as a national park by the Forty-first Congress of the land fifty miles square which fills the northwest corner of Wyoming Territory has not been followed by legislation either for the purpose of making it safely accessible to private scientific research, or, in advance of that, of providing for a permanent or even temporary commission of observation and survey,—the common wish of all representatives of scientific branches who have had the good fortune to be members of past exploring parties. However, as the world hears more and more of this "other American wonder" from an adventurous hunter or curious traveller, it is probable that within a few years our characteristic munificence in such matters will complete the gift to the world by actual presentation, when the rest will quickly follow. Not the least interested then will be the medical hydrologist, for within the space where the artist's field is so novel in contrasts of beauty and grandeur, the geologist's and chemist's so open for the determination of natural formative processes and chemical changes now working, the botanist's and zoologist's for the collection of additional facts concerning the distribution of plants and animals, there exist an uncounted number and the greatest variety of waters, which together include examples not only of all the kinds into which known springs are divided, but many not found in the lists of fashionable sources. Partly upon the reports,* and partly upon personal experience, are based the following notes, intended for those whose professional interest has been excited by newspaper paragraphs, and who have not had the time to find and arrange what, buried among topographical and geological itineraries, is their especial concern.

The Park is included in the Yellowstone-Seton Basin, an elevated plateau which contains the main "divide" of the Rocky Mountains and many minor watersheds which form the sources of the principal rivers of the Northern continent. It is consequently divided into numerous sections, differing widely in altitude, and only generally correlated, each possessing a rolling or hilly surface, covered with dense forests, and containing many lakes, the chief of which are the Yellowstone and Shoshonee, and many valleys of the streams which are the sources of the Snake and the Yellowstone and Madison Rivers, the main branches of the Columbia and the Missouri Rivers. These streams have all rapid descents, sometimes sudden, and giving rise to many falls, cascades, etc., and, when united before emerging from the plateau, cut deep valleys; one, the Yellowstone, making in the course of its flow two leaps constituting the Upper (150 feet) and Lower (328 feet) Falls.

The geological characters are essentially volcanic. There is probably no other section in the world, however, where the grand and grotesque results of such action in the later geological periods are so closely contrasted by the effects of subsequent processes terminating the period of volcanic activity. These latter are seen in a number of confined areas, occupied by thermal springs and geysers, and present strange pictures with the immediately surrounding vegetation, which elsewhere is luxuriously abundant and varied, and often arranged so as to suggest the trimming of art. The zoological features do not differ generally from those of the neighboring basins, but what differences exist must be very peculiar, strikingly instructive, and novel in the inhabitants of the hot waters. Of course the sport of hunting is afforded, but the region is, like all others in the

* The following is the complete literature on the subject of the Park:

1. Two Congressional Docs.—Report of Lieut. G. C. Doane, U.S.A., and Report of Capts. Barlow and Heath, U. S. Engs., 1871.
2. Report of U. S. Geological Survey, 1871. Hayden. Washington, Government Printing Office.
3. Report of U. S. Geological Survey, 1872. Hayden. Washington, Government Printing Office.
4. Wonders of the Yellowstone. Edited by J. Richardson. New York, Scribner, Armstrong & Co., 1873.
5. Northwestern Wyoming, including Yellowstone Park, 1873. Capt W. A. Janes, U.S. Engs. Washington, Government Printing Office, 1875.
6. The "Great Divide," Lord Dunraven. New York, 1876.
7. Article by Prof. T. B. Comstock in Am. Jour. Science and Arts, vol. vi., Dec. 1873; also, by the same author, in American Naturalist, vol. viii., Feb. and March, 1874.
8. Article by Dr. C. C. Parry in American Naturalist, vol. viii., Jan., Feb., March, and April, 1874.

Rocky Mountains, uncertain in amount and time,—the seasons for large game particularly being undetermined, probably following no law. Fish, lake and river trout, are plenty at all times.

The complete climatology has not been written, because never continuously observed, but from the meteorological records of expeditions made during the summer months, and the weathering effects in rocks, fissures, etc., it may be judged that the temperature is very low and steady during the winter, very variable within the lower degrees in early spring and late fall, and that at times during the remainder of the year it comprises at the Lake elevation (7564 feet above sea-level) the diurnal extremes 12° Fahr. and 80° Fahr. An approximation of mean annual temperature (determined from springs) is 37.5° Fahr. The nights are cold even in mid-summer, and the freezing point is often reached just before sunrise late in August, 14°, 13°, and 12° Fahr. having been remarked in three successive years; the days, however, from May to October are cool and agreeable. The prevailing winds are westerly and mild. The abundant vegetation is evidence of copious rain-fall.

The diurnal variations of temperature must be especially noted, for of all *hygienic* considerations in the selection of a station suitable for the treatment of a disease, this is the most important. Altitude and other climatic conditions follow, but the immediate effect of these is not so marked on persons afflicted with chronic debilitating diseases, who compose a great part of the number of travellers for health. Indeed, experience seems to have lately changed some of the older opinions in regard to residence at high stations; but even if more were positively known of the benefits derived from altitude, taken in connection with humidity, prevalence of certain winds, etc., it would not alter the fact that during certain stages of tubercular disease, for instance, sudden and great changes of temperature are injurious. If we would take into account special hygienic conditions required by patients, such as change of scene, habits, regimen, the necessity of modifying influences to distract from or incite to study or other pursuits, etc., nature never presented a more varied field from which to select in such a small extent of territory. One can take the alpenstock and scale snow-topped peaks, fish or hunt for one's dinner in charming valleys, ply the oar in one of the most beautiful lakes in the world, picnic at any number of enlivening falls, surrounded by the most novel scenery. As for study, the *roué* become melancholic would be seduced into healthful activity.

The Park is also especially rich in *balneotherapeutical* means, or the *indirect* actions of mineral waters,—the second term to be considered in hydrotherapy. These depend on physical conditions, one of the fundamental of which is high temperature, for the reason that it affords a greater variety of methods of administration, particularly of waters feebly mineralized, so that among the sources well known in Europe for this advantage it is not certain whether the chemical constituents of some are indifferent or not in the production of the effects. The methods consist in baths of different temperatures, douches, vapor-baths, inhalations, etc., by means of waters for the most part mildly sulphated, bicarbonated, or chlorinated; their action upon the organism is thus diversified, the activity of the water is increased or diminished at will, so as to answer many different indications,—one and the same water often being made to produce an alterative, sedative, or resolutive effect. To accomplish this at most springs, artificial structures are necessary. In the Park, on the contrary, at all of the groups of springs every one of all imaginable applications of mineral waters is naturally feasible. Nothing is needed to vary the temperature,—a range of 100° Fahr. often existing in a number of springs within a stone's throw of one another, and, moreover, in many places the same spring exhibiting during twenty-four hours very different degrees of thermal activity; and this in waters with all shades of mineralization, from the clear, cold sources fifteen hundred feet above the lake level, disturbed only by the faintest gaseous action, and the slight medicinally-impregnated geyser waters, to the supersaturated mud volcanoes. The celebrated terraces of tubs on Gardiner's River notably offer all means of applying the douche; the immense steam jets on Orange Creek furnish a method of vapor-bath and inhalation that cannot be artificially imitated, for the volumes of steam always carry more or less of the products of the ill-understood chemical action in the dark caverns from which they escape. It would be too

lengthy to particularize, but in addition to the usual methods attention may be directed to the facilities for much medication now obsolete except among some Indian tribes on this continent, and to the many manners in which the various positions of solfataras and fumeroles can be used.

The *direct* medical action of a water depends on its chemical constitution, which is, consequently, the most important item in considering a water with reference to a disease. Before the beginning of this century the reputation of springs reposed on tradition, the printed accounts of their action were meagre and vague, and the diseases said to be curable by them were enumerated without reason. To chemistry are due the greater precision and the more scientific basis of modern hydrology. However, there is a great deal yet that is inexact, for, after careful quantitative analyses even, we are not always able to distinguish therapeutically two waters. It sometimes happens that two sources may have all the same ingredients in very similar proportions, and yet be directly opposite in medicinal qualities. Springs are now classed according to the predominance of one or more well-known principles, and these, taken together with their temperature, climatic condition, etc., furnish the indications; the conclusion as to effects is thus reached by analogy. A more strict and exact method would be to abandon reliances upon exclusive water-analyses, and arrange springs under heads of *chemical activity*, the kind and amount to be judged by the kind and amount of the contents not only in solution and emitted as gases, but deposited in various conditions of exterior and interior temperature. However, as it is, the sources in Europe remarkable for their intrinsic and special medical action are sulphuretted or strongly bicarbonated or chlorinated. In the Yellowstone Park, although there is a greater number of springs belonging to two of these classes, they differ greatly in one respect from the European waters. This difference is basic, and, consequently, it is very probable, does not alter the medicinal properties enough to destroy similarity in effect. It consists in the substitution of lime or magnesia for soda, which is universally absent for practical purposes. The presence of strontia, baryta, lithia, or potassa is not proved, more careful analyses being necessary. To the only class which is founded on the predominance of a base—viz., ferruginous waters—belong nearly all of a single group—the Green Spring Hills,—and they include the sulphated and the iron-manganese* subdivisions, but do not contain the bicarbonated iron.† One peculiarity of the iron waters here is the high temperature of the greater number. Now, although the most common administration of ferruginous waters is internal, the utility of baths being doubtful, this may partly be attributed to the fact that an immense majority of the iron springs in Europe and America are cold and bicarbonated. Of the few exceptions, the sources of Luxeuil (Haute-Saône), which are thermal, but very feebly mineralized, are yet celebrated for the successful treatment of uterine and vaginal affections. In regard to the acidulous or bicarbonated waters, it may be mentioned here that there are many springs in this region which chemically and physically should be classed among them, but I believe that it is generally held that such sources rising in volcanic regions contain relatively too small a quantity of free carbonic acid, and are useless as such. Still, as there are all degrees of volcanic activity, and as one is often surprised at the unexpected amount of carbonic acid evolved, at many Gardiner's River springs for example, it would be too sweeping to exclude on this ground even the strongly bicarbonated waters.‡ It must be remembered, however, that they are all bicarbonated lime or mixed. The chlorinated waters as a class have sodium or potassium or magnesium as the principal base, and in them generally are found the iodides and bromides. There is not a bit of chemical evidence to prove the presence of a single spring with prevalent chlorinated constituents within the limits of the Park, although undoubtedly such exist in the neighborhood,—at Camp Brown, W. T., for instance; still, one who has tried the waters of Wiesbaden, the most celebrated of the kind, cannot help remarking a strong analogy between it and some springs in the Park, at least in physical properties and physiological effects. On the other hand, the sulphated waters are abundant, including the soda,

* Manganese exists in the red deposit of these springs.
† A carbonate is found in the deposit.
‡ Peale, Hayden's Report, mentions one of the older springs on Gardiner's River as having the piquant taste and other characters of a bicarbonated water.

magnesia, and mixed. Their successful use in the neuroses, neuralgias, dermatoses, rheumatism, and chronic metritis is indicated. It is mainly, however, in the prominence of an incomparable number and variety of sulphuretted springs that the Yellowstone Basin excels, and it is upon this basis that the following division of groups is made.

Prof. T. B. Comstock has enumerated seventeen main groups in local order, which, for the sake of conciseness, and because, as will appear, of similar physical and chemical features, are here rearranged. In general, twelve are situated on the shores of the Yellowstone Lake, or the banks of the Yellowstone River, within a distance of fifteen miles from the lake outlet, or on streams flowing into the lake or river. Four are on the forks of Madison River, and one on Shoshonee, Heart, and other lakes and the streams which aid in forming the headwaters of Snake River. All of them are beautifully located at points excellently adapted for buildings, garden ornamentation, etc., and have within easy reach facilities for pure, cold, and palatable water. The farthest removed from the outlet of Yellowstone Lake, Gardiner's River group, is thirty miles distant in direct line; the Geyser groups are about twenty-five miles from the same point. The altitude of each compared with the level of Yellowstone Lake is given in brackets, together with the lowest and highest temperature, Fahrenheit, of single springs observed in 1873. When the lowest temperature is not noted, it signifies that it is very variable, and due to the length of interval between eruptions or maxima of action.

(*a*) 1. Turbid Lake group (alt. nearly same as lake: 60°–192°).
2. Warm Spring (alt. below: 100°–192°).
3. Steamboat and East Shore (alt. of lake: 100°–192°).

(*b*) 1. Green Spring Hills on Pelican Creek (alt. little above lake: 100°–124°).
2. Forest (alt. 75 feet below: 88°–170°).
3. Wayside (alt. about 500 feet above lake: 86°–196°).

(*c*) 1. Gardiner's River (alt. about 1000 below: 144°–164°.)

(*d*) 1. Lower Geyser Basin (alt. 432 feet below: — to 200°.)
2. Half-way (———: — to 200°).
3. Upper Geyser Basin (alt. 191 feet below: — to 200°).
4. Two groups on S. W. arm of Yellowstone Lake (alt. of lake above: 70°–180°).
5. Silica jets (alt. 1400 feet above: — to 194°).
6. Brimstone group (alt. 1500 feet above: 100°–180°).

Unclassified,—
1. Hot Springs, East Fork Madison, belonging probably to *d*.
2. Springs at Heart Lake, etc.
3. Mud volcanoes and crater hills, belonging probably to *a*.

The general physical differences are as follows:

In the groups of *a* there is always a central pond or ponds supplied by overflow of surrounding springs, by fresh-water streams, and by immediate springlets on the shores which show the character of the supply from the bottom of the ponds. The temperature of these common bubbling reservoirs is comparatively lower (being 60° to 70°) than that of the springs proper. In these there is a preponderance of sulphur or of argillaceous deposit; the waters are either of a muddy (salses) or milky (solfataras) character; their action appears to be intermittent within a limited range of temperature, the maximum being signified by a more than usual rise of vapor, sulphuretted hydrogen and carbonic acid gases.

(*b*) A majority of springs with colorless water commonly overflowing and forming together or adding to the current of a small stream; deposits, white, orange, and red; silica and iron more marked than in last; intermittent action uncertain; emission of vapor and sulphuretted hydrogen.

(*c*) Springs occur in terraces made up of bathing pools of comparatively soft material (carbonate of lime principally, with very little silica), usually white or superficially colored by iron or organic matters; water clear; action intermittent within very small range of temperature; emission of watery vapor and relative excess of carbonic acid.

(*d*) Geysers; water clear; forms by deposit hard conical rims (geyserite), often slightly colored by iron, manganese, etc.; action intermittent, sudden, not prolonged, and within great range of temperature; constant production of small amount of vapor with carbonic acid and sulphu-

retted hydrogen, which is greatly increased during maximum of action.

It is necessary to remark that the geographical division into groups is not in every case strictly in accordance with the division by physical features; some of the former extend over a considerable extent of territory, and consequently may include several of the latter. This will be additionally apparent from the chemical differences, for two groups, *a* and *c*, contain waters which fall under both divisions which markedly separate *b* and *d*.

Particularly in sulphuretted waters the difficulty of chemical analysis occurs, and it is only since Anglada's observations on the springs of the Pyrenees that anything definite has been known of the relation between their constituents and effects. These waters are artificially inimitable, as a rule, for the reason that they are only medically useful at their sources, where their properties depend not so much on their contents in solution as on the chemical processes in action. Nevertheless, Fresenius (Quant. Analysis, § 212), in his remarks on the deportment of sulphuretted waters, gives tests which seem to elucidate somewhat their action. Upon these the following division is founded. The behavior of two distinct sulphuretted waters depends on the different proportion which the sulphur in combination with hydrogen or metals bears to the free carbonic acid; in the waters of Weilbach, for instance, it is 1 : 24, and in that of Stachelberg, 1 : 2. Consequently, in waters like the former (I.) nearly the whole of the sulphur not combined with oxygen is present as free sulphuretted hydrogen; as the amount of this becomes less and less on exposure of the water to air, the separated sulphur oxidizes to sulphuric acid, which dissolves. In the latter (II.) the free sulphuretted hydrogen is hardly perceptible to the smell, and after a time with full access of the air a precipitate of sulphur subsides, and hyposulphites are formed at the same time. A current of carbonic acid conducted into it converts the sulphur of the sulphides in the water into free sulphuretted hydrogen. The temperature exercises also some influence in this relation between the two gases.

The first class (I.) may be termed sulphydric waters; the second (II.) are the true *hepatic* waters.

In the Yellowstone region, to the sulphydric waters (I.) belong all of *b*; to the hepatic waters (II.) all of *d*. Still, it is very probable that many of the former (*b*) are *purely* what are considered simple solutions of sulphuretted hydrogen, and thus are probably independent of any chemical action, with reference at least to carbonic acid gas. In regard to *a* and *c*, Fresenius's tests, applied some time after collection to several waters of each group analyzed with their deposits, show that both I. and II. are contained in all the groups. A partial explanation, I think, is found in the behavior of the different waters of the single group of *c*, for here it appears, although the results were delicate, that the older springs, those which deposited a greater amount of silica, reacted for II., while the comparatively later waters fall in I. It was also discovered that the soluble part of the mud of the mud-volcanoes belongs to II., while the waters with marked alum taste existing in groups of *a* come under I.

It may be stated in addition, according to subsequent analyses of the water, —some of which had been frozen, however, —that the waters of Class I. contained iron, alumina, and magnesia, but no lime; sulphates, but no sulphides. Those of Class II. contained all four bases, and both sulphates and sulphides. Only a few of I. contained chlorides, all of II.

In conclusion, with reference solely to the sulphurous principles, based on the analogy of celebrated European waters, the following are the therapeutical indications of the springs of the Yellowstone Park. The sulphydric waters are applicable to catarrhal affections in general, but more particularly of the bronchial and laryngeal mucous membranes, and to those of the stomach and bladder. The hepatic waters proper are adapted to any of the three groups into which Durand-Fardel divides the applications of sulphuretted waters, in the order of their importance. To *special* applications, which are wholly due to the sulphurous quality of the water; the *dartres* or herpetic diathesis and catarrhs of the respiratory passages. To *common* applications in which stimulation of the skin, thermality, etc., are required to aid the action of the sulphurous principles; lymphatism, rheumatism, chlorosis, syphilis, and scrofula. To *seconaary* applications in which the sulphurous principles are accessory, the effects being mainly due to balneo-therapeutical pro-

cesses; chronic metritis, catarrhs of the urinary organs, surgical diseases, and dyspepsia. It may be said that the National Park sulphurous waters in general will be found to exert their most important special action on the skin and the respiratory mucous membranes.

FORT WOOD, N. Y. HARBOR, May 5, 1876.

A CASE OF CANCER OF THE PYLORUS IN WHICH GREAT RELIEF FOLLOWED THE WASHING OUT OF THE STOMACH WITH DILUTE ALKALINE SOLUTIONS.

BY JAMES H. HUTCHINSON, M.D.,

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Read before the Pathological Society, February 10, 1876.

THE specimens which I have brought before the Society this evening were removed from the body of a woman who died at the Pennsylvania Hospital, January 19, after an illness extending over more than seven months, during the latter part of which she was under my care.

The following important facts in her history are derived from the daily notes of the case, taken by my clinical clerk, Dr. Morris J. Lewis.

K. M., æt. 31, Irish, married, housekeeper, was admitted to the Women's Medical Ward on October 8, 1875. Her parents are no longer living, her father having died of a fever, and her mother of a tumor of the abdomen, the exact nature of which cannot be ascertained. With this exception, if it be one, no member of her family appears to have suffered from either tubercular or cancerous disease. Six years prior to the beginning of her last illness she had an attack of rheumatism, for which she was admitted into a hospital, where she remained a year before a cure was effected. During her married life, which lasted about four years, she had two miscarriages and one still-born child. Last June she began to suffer from attacks of faintness, and from pains in the stomach after eating; the latter occurring no matter what the character of the food might be, and being only relieved by vomiting, which generally came on in from one to two hours after her meals. The matters ejected were generally dark-brown in color, but occasionally they were quite black. In addition to these symptoms, she complained, at the time of her admission, of "lumps" in her abdomen, which she said she could feel passing from one side of her body to the other. My colleague, Dr. J. Forsyth Meigs, who first had charge of the patient, sent some of the vomited matter to Dr. J. G. Richardson, the microscopist to the hospital, to determine whether or not it contained red blood-corpuscles; but neither at this nor at any subsequent examination were any found.

At the time of the transfer of the ward to my care, the following note was made: "The patient is emaciated and extremely anæmic, but is said to be stronger than when admitted, the vomiting not being so frequent. A few enlarged glands can be felt in the right groin, but no tumor or induration can be detected in the abdomen, even on deep pressure; and this pressure causes no pain, but excites so much contraction of the muscles that a satisfactory examination cannot be made. The 'lumps,' of which she complains bitterly, appear to be caused by irregular peristaltic action; they can be distinctly felt and seen passing along the course of the bowel. A ventral succussion-sound is heard when the patient is moved from side to side. Careful examination of the lungs, liver, heart, and of the eyes with the ophthalmoscope, gives only negative results; and the same is true of the examination of the urine."

After having in vain attempted to prevent the vomiting by the use of sulphite of sodium, bromide of potassium, and oxalate of cerium, and the restriction of the diet to lime-water and milk, I determined, on the 24th of November, to make the attempt to nourish the patient by nutritious enemata. Notwithstanding, however, that no food was taken by the mouth, she still continued to vomit, sarcinæ ventriculi and starch-granules being found in great abundance in the ejecta, showing that food had been retained in the stomach in an undigested condition for some days. Under these circumstances, I determined to continue the nutritious enemata, but at the same time to have recourse to Kussmaul's plan of washing out the stomach with a dilute alkaline solution, a drachm of bicarbonate of sodium in a quart of water. Wyman's stomach-pump was the instrument to which I had recourse at first; but the use of this, although entirely successful

in preventing vomiting, involved the loss of so much time that a Thudichum's douche was substituted for it. This being attached, by means of the india-rubber pipe that generally accompanies it, to the tube which is introduced into the stomach, the alkaline solution was allowed to pass into the stomach by its own gravity. While the tubes were still full, the bottle was suddenly depressed below the level of the patient's body, and, the india-rubber tube being detached from it, a siphon was thus formed, through which the liquid contents of the stomach freely flowed, thus entirely emptying it. This was repeated two or three times at each sitting, without the slightest discomfort to the patient. When first resorted to, the operation was repeated every day; but the accidental omission to do it upon one day showed that once every other day was sufficiently often to prevent vomiting.

When the treatment was first instituted, it will be remembered that the patient vomited after every meal, that occasionally a change of position would be sufficient to cause it, and that even during the time when an attempt was made to nourish her by the rectum, vomiting still took place. On the other hand, from the time the stomach-pump was first employed until her death, a period of rather more than seven weeks, vomiting occurred only twice, or at most three times. During this period, she was able to take food freely. She was, of course, allowed as much milk as she could take, but in addition to this, ate, with relish, toast and egg for her breakfast, and oyster-soup for her noonday meal. It is scarcely necessary to add that the patient was rendered much more comfortable by this treatment. In fact, this was so much the case that after I could no longer doubt the malignant character of her disease, and was therefore disposed to abandon it, she begged that it might be continued. From the time the stomach-pump was first used, until her death, she had at night a hypodermic of morphia, which gave her a comfortable night. She had also an occasional purgative; but with these exceptions there was no medicinal treatment during this time.

The treatment did not, however, only render the patient more comfortable; it enabled me to make a diagnosis, by diminishing the distention of the abdomen, and, secondarily, the extreme irritability of the abdominal muscles. During the third *washing out* I felt a hard body to the left of the median line, just under the arch of the ribs. At subsequent examinations this was always found, sometimes in the median line, and sometimes to the right of this, but never so far over as the normal position of the pylorus. It also changed its position when the patient moved from side to side. The "lumps," as she called them, also occurred less frequently.

The passages, which were very infrequent, and obtained with great difficulty, were fæcal, showing that some food passed the pyloric orifice.

The patient died, January 19, 1876. The autopsy was made by Dr. Longstreth, from whose notes I make the following extract:

"The abdomen contained a small amount of fluid in its cavity. There was an old fibrous adhesion on the upper surface of the liver, but no evidence of general peritonitis. The stomach was prominent and partially distended. When completely filled with water, its long circumference was twenty-five and one-eighth inches, and its short circumference seventeen inches. It held, distended, two quarts, one pint, fourteen ounces. At the pyloric orifice was a firm mass, involving the anterior wall and the pyloric end of the lesser curvature, with enlarged glandular masses above and below. The walls of the stomach around the mass appeared thickened, and as if plaited into folds. The glandular enlargements extended into the mesentery, the glands varying in size from a grain of wheat to a horse-bean; on section they were exceedingly firm, and of a uniform white color. The lesser curvature was shortened one-half by adhesions to the mass; the greater curvature seemed markedly extended. The diseased condition ended abruptly with the stomach; the duodenum was bound down by adhesions, and made a sharp turn downwards and to the back. When the stomach was filled with water none escaped, even when the cardiac extremity was elevated. It was possible, however, by working the fingers up the duodenum, to assist the escape of the water. The water was prevented from passing by the plaited arrangement of the walls of the stomach and the sharp bend of the duodenum. The passage, as the finger passed upwards into the stomach,

did not seem much contracted, except by the folds mentioned, and the walls were soft and free from ulceration. On the inner surface of the lesser curvature, corresponding to the hardened mass outside, the mucous membrane exhibited a large ulcer with thickened edges, which affected the whole circumference of the pouch towards the pylorus. The remainder of the mucous membrane was normal, showing no abrasions, ulcerations, or congestion to any marked degree. The muscular fibres were very plainly to be distinguished, and seemed slightly hypertrophied. The œsophagus was very carefully examined, but showed no evidence of abrasion.

"Liver, weight one pound fifteen ounces. Its outline was regular, and its upper surface was notched by a deep furrow, showing white fibrous tissues. On section, the tissue was of a reddish slate-color and firm, and considerable blood flowed from the hepatic veins. In the right lobe, on its lower surface, anteriorly, between the round ligament and the gall-bladder, which latter was partly adherent to it, was a firm, white nodule, measuring one and a half inches in diameter; it was irregularly nodulated, and extended into the liver-substance about one inch. On section it was found exceedingly firm, almost cartilaginous, at points showing the calibre of vessels. The tumor was dry, exuding no juice."

The other organs were healthy.

Dr. Longstreth has omitted to mention, in his notes, the fact that the obstruction at the pyloric orifice was complete only when the stomach was fully distended; when it was partially emptied the water ran into the duodenum freely enough. It would seem, from this, not irrational to suppose that the washing out of the stomach was useful partly by preventing this extreme distention and thus allowing food to pass into the duodenum.

The specimen was referred to the Committee on Morbid Growths, which reported, February 24, 1876, as follows:

"Thin sections cut from the tumor of the stomach, presented by Dr. James H. Hutchinson, exhibited, when microscopically examined, nests of cells, rounded, oval, and caudate, often furnished with large nuclei, and arranged in the meshes of an abundant fibrous stroma, the trabeculæ of which bear in thickness, as compared with the diameter of the alveoli they enclose, that proportion usually assigned to hard cancer. The specimen is therefore unquestionably one of scirrhus ventriculi.

"The tumor in the liver, from the same case, displays similar cell-elements, embedded, however, in a scantier stroma, which nevertheless is more abundant than that commonly possessed by secondary neoplasmata in the hepatic parenchyma."

Although this plan of treating chronic diseases of the stomach was brought to the notice of the profession so long ago as 1867, it seems to have excited singularly little notice in this country. In cases of dilatation of the stomach dependent upon long-continued catarrh, it is said by Kussmaul, its originator, to be alone sufficient to effect a cure. In the case which I have reported to-night, it could, of course, do nothing more than give relief; and this it certainly did. Notwithstanding the gagging which was caused by the passage of the tube through the pharynx, the patient not only consented to its introduction, but positively demanded it.

The following conclusions would seem to be properly deducible from the history of this case:

1. That washing out the stomach will be useful in dilatation of that organ dependent upon stricture of the pylorus, even if this be due to malignant disease, by lessening the frequency of the vomiting.

2. That it diminishes the intensity of the pain, by preventing extreme distention of the stomach and by the removal of its irritating contents.

3. That it renders possible the introduction of food into the stomach, and its digestion.

4. That it may sometimes facilitate diagnosis.

REMARKS ON CHEYNE-STOKES RESPIRATION, ESPECIALLY IN CONNECTION WITH TUBERCULAR MENINGITIS.

BY WILLIAM PEPPER, A.M., M.D.,

Professor of Clinical Medicine in the University of Pennsylvania.

I FIND, on referring to the notes of cases in which I have observed this peculiar form of respiration, that I first noticed it in a case of cardiac and renal disease, with uræmia, in 1866. Since then I have met with it so frequently that I am

somewhat surprised to find it so rarely mentioned by writers in this country. I have used the name at the head of this article because, although without any pathological significance, it is the one by which this respiratory phenomenon is most familiarly known in Europe. The following description may serve to give an idea of its general character: the breathing is from time to time interrupted by periods of apnœa of varying length (five to thirty seconds), between which occur a series of respiratory acts, which begin by very feeble and barely perceptible movements, and gradually grow fuller and stronger until they reach a climax, when they occasionally terminate by a long-drawn sigh or more commonly pass through a descending scale of movements, each growing more and more feeble until they end with barely perceptible respirations, such as marked the beginning of the series. This period of respiration, which also occupies from five to thirty seconds, is followed by a second period of complete apnœa, which is in turn succeeded by a group of respirations similar to the first.

Before alluding to these clinical peculiarities more in detail, a brief reference to previous descriptions of the phenomenon should be made. Although there is every reason to suppose that this form of respiration had been noticed long ago, and included, without special description, under the head of irregular or intermittent breathing, no direct reference to it appears to have been made until Cheyne in 1818 (Dublin Hospital Reports, vol. ii. p. 221) described it as occurring in a case of fatty degeneration of the heart.* For some time no further study seems to have been made of this striking phenomenon; but in 1854, Dr. Stokes, in his classical work on Diseases of the Heart and Aorta (p. 324), gave a vivid description of it, also in connection with cases of fatty degeneration of the heart, with which he believed it to be invariably associated. Following this we find a brief allusion to it by Schiff (Lehrbuch d. Physiologie, 1858, p. 325), who attempted the first explanation of it, assuming that it was due to fluctuations in the pressure of the blood on the nerve-centres. Since then, numerous articles upon this subject have been published, among which may be particularly mentioned those by Little (*Dublin Journal of Medical Science*, vol. xlvi., 1868, p. 46), by Traube (*Berl. Klin. Wochenschrift*, 1869, No. 27, July 5), and by Laycock (*Dublin Jour. of Med. Science*, vol. lvi., 1873, p. 1).

Various names have been suggested by the authors who have written on this form of disturbed respiration. It was called "*ascending and descending respiration*" by Stokes and others; "*recurrent brief apnœa*," by Laycock; "*pendulum-like respiration*" by Brückner (*Virchow's Archiv*, vol. lii. p. 155); and by Traube and others, "*Cheyne-Stokes respiration.*" I have adopted this last because it is historically correct, and because none of the other names hitherto suggested appear sufficiently descriptive.

Originally supposed by Cheyne and Stokes to be invariably associated with fatty degeneration of the heart, it was shown by Little that it may occur in connection with other organic affections of the heart or aorta; and by Traube and others it has been noticed in connection with cerebral hemorrhage, tumors of the brain, uræmic coma, and the exudative stage of tubercular meningitis. I have myself met with it under these various conditions, with the exception of intracranial tumors, and have selected the following cases in which this peculiar form of breathing was observed in tubercular meningitis, chiefly because I believe it has a degree of diagnostic importance in that disease which is not generally recognized.

Case I.— Tubercular meningitis; Cheyne-Stokes respiration; death; no autopsy.

G. S., boy, æt. 24 months, was seen August, 1875, in consultation with Dr. E. A. Rex. Born of a mother with strong family tendency to tuberculosis, though she herself is well; father healthy. Mother nursed the child until the age of 14 or 15 months, and it seemed to thrive well, with the exception of a short attack of summer-diarrhœa. Several months ago an indolent enlargement of some of the cervical glands of right side of neck appeared. One of these softened and discharged, leaving an ulcer which resisted all applications and continued open when I saw him. His mother was disposed to attribute the attack to gastric irritation, following eating a peach; but in reality the repeated vomiting which

* In the admirable address delivered last year before the British Medical Association by the late Dr. J. Warburton Begbie, a case is quoted from Hippocrates, in which the learned speaker (Med. Times and Gazette, August 7, 1875, p. 154) inclined to think this peculiar form of breathing was alluded to. On reading the description of the case, which may probably have been one of acute nephritis, with uræmia, in the original and in Daremberg's translation, however, I cannot see that anything more is intended than the infrequent, deep breathing with long intervals, which is so often met with in states of partial or complete coma.

occurred on the first two days was without apparent cause. Remedies were given to allay it, and it did not return. The bowels were from the first constipated. Irregular fever made its appearance, with restless sleep, grinding of the teeth, flushings of face and surface, and occasional sweating, especially about the head. The child grew more and more dull, and for thirty-six hours before I saw him, it had been impossible to rouse him.

I found him lying partially on the right side, with decided flexion of the right leg, and, to a less degree, of the right arm. There was convergent strabismus of the right eye. The lids were kept partially open. From time to time brief spasmodic movements of the right arm or leg would occur. There were also occasional quick movements with the tongue, causing a slight clacking noise. The pupils were equal, of moderate size, and responded to light very imperfectly. Vision was apparently lost. The cheeks were flushed, the head warm and moist. No sign of pulmonary disease. The pulse was frequent and irregular; counted for an entire minute it was about 140 and 145; but there were periods lasting three or four seconds, during which its rate was decidedly slow, and, on the other hand, these were succeeded by periods during which the rate of the pulse must have been over 175. On closer observation it was found that these alternations coincided with very marked alternations in the respiratory movements. The respirations numbered thirty or more in a minute; but they were interrupted four or five times in the course of each minute by quite long pauses (five to six seconds). A faint respiration would then occur, and then a stronger one, and then, rapidly, three or four others, quite powerful; then one or two of lessening force and depth, and at rather longer intervals, and then another pause similar to the first described. The pulse was evidently much affected by the variations in respiration. At first, when the breathing began to fail, no change of pulse was observed; but by the time the pause had lasted two seconds a distinct slowing of the pulse-rate was observed, which continued until breathing was re-established, when the pulse again became as rapid as previously. This series of phenomena was observed time after time, with great care. The abdomen was retracted; there was no eruption. The power of deglutition was still retained. Death occurred fifty-seven hours later; the peculiar breathing above described continued until near death. No autopsy could be obtained.

Case II.—Tubercular meningitis; Cheyne-Stokes respiration; death; autopsy.

Mary McG., æt. 4½ years, admitted to the Children's Hospital in June, 1874, with eczema capitis. On October 13, she was noticed to be dull and slightly feverish towards evening, with occasional vomiting and marked anorexia. This continued until the evening of the 16th, when, after seeming brighter for a few hours, fever returned, with wild delirium, and restless sleep disturbed by tossing of the head from side to side and gritting the teeth. Bromide of potassium was given in doses of gr. xij every hour, and after sixty grains had been taken, quiet sleep was secured.

The following day quiniæ sulph., gr. ix in course of the day, was directed, and bromide of potassium was continued in full doses. During the day and night there were occasional spells of restlessness and slight delirium, but for the most part the child was quiet, without taking any notice.

October 18.—Child was dull and quiet, but free from restlessness or delirium. After being asked repeatedly whether she had pain, she answered distinctly, "yes," but could not be induced to speak again. Her sensibility was evidently much blunted, as she allowed flies to crawl on her face. She lay on the back, with the knees strongly flexed on the trunk, and with occasional twitching of right arm and leg and rolling of the head. When the finger was drawn over the surface, it was followed by a dark-red streak, which came slowly and faded slowly (tâche méningitique). Respiration rather slow, with occasional long-drawn sighs; pulse 96, slightly irregular. Eyes kept half opened, with evident weakness of left external rectus. Considerable difficulty in deglutition. For a few hours she aroused and seemed brighter, and asked for a drink; but later she became unconscious, and had repeated attacks of spasm, which continued during the night. Iodide of potassium was added to her treatment.

October 19.—Eyes rolled upwards; convergence of left eye. Slight irregularity in the face. Impaired power of left arm and leg. During afternoon, she again revived so as to be occasionally conscious and able to speak, and to take food and medicine.

October 20.—Still conscious at intervals, and spoke distinctly a few times. Free perspiration about the head. Pulse and breathing as before.

October 21.—Severe convulsions early in the morning. Later, she lay very quiet, occasionally opening her eyes and looking upward with a peculiar weary expression, with elevation and slight contraction of the brows, as if from pain. After this look there was a contraction of the eyelids and a slight moan or a shrill scream. There was no constant squint, but from time to time the eyes were strongly converged. The cheeks were flushed, and there were occasional sweatings about the head; meningitic streak clearly developed. She paid no attention if gently handled, but when disturbed uttered a short shrill scream.

The *respirations* were very irregular, and interrupted by long pauses. Thus, there was an interval of quiet amounting to five or ten seconds, and then a group of five or six

respirations (inferior-costal in type) occurring quickly together, beginning with a barely perceptible movement and progressively increasing until the last one was often a long-drawn sighing breath. This was followed by another interval of suspended respiration. The *pulse* had rapidly increased in frequency, and was now 144 in a minute, and irregular in both rhythm and force. During the intervals of suspended respiration the action of the heart grew labored and slower, and marked epigastric pulsation was visible; the systolic sound also grew duller and more feeble. With returning respiration, the action of the heart became more frequent, and the sounds at the apex were better developed. There was marked accentuation of the pulmonary second sound; and during the intervals the first sound, as heard at the pulmonary and zyphoid cartilages, became more dull and feeble, while the accentuation of the pulmonary second sound grew especially more marked.

October 22.—More conscious, and took food and medicines well; general symptoms and character of breathing as before.

October 23.—Passed into deep stupor at 1 A.M., and continued so. She lay very quietly; pupils dilated, left larger than right; sweating of face and head; pulse 160, irregular; breathing quick and irregular, the Cheyne-Stokes type not so well marked; total inability to swallow.

The patient remained in this condition until time of death, October 24, at 9 A.M., about eleven days from inception of attack.

Post-mortem examination.—There was extensive effusion of lymph over the under surface of the anterior lobes near the longitudinal fissure. This was especially marked about the optic chiasm, where the membranes were thickened, opaque, and infiltrated with miliary tubercles. The same conditions extended into the fissures of Sylvius, especially on the left side.

There was marked neuritis of left motor oculi, and for nearly one-fourth of an inch the nerve was somewhat softened, congested, and discolored.

There was also marked meningitis, with exudation of lymph, around the pons, especially on the left side, where it involved the trunks of the facial and pneumogastric nerves.

Although in the above cases the diagnosis was sufficiently clear, it must be familiar to all that there are some cases of tubercular meningitis, especially in very young children, where it remains to a late period in the case very difficult to determine the true nature of the attack. The affections for which there is most danger of mistaking the disease are typhoid and typho-malarial fevers; and when it is borne in mind how closely their symptoms may at times simulate those of meningitis, and how difficult it may be to obtain, in very young children, a satisfactory ophthalmoscopic examination (which is one of the most valuable means of differential diagnosis), it will be readily understood that any additional symptom of positive diagnostic value is of great importance. It is true that the Cheyne-Stokes respiration is not a constant symptom of tubercular meningitis, but my own observation convinces me that it is very frequently present, although at times in a somewhat modified form, and that, when observed, it is of most positive diagnostic value.

There are several points in the clinical account of this form of breathing which call for a more detailed description.

In the first place, the pause in breathing or the period of apnœa is usually complete; no movement of the chest-wall occurs, and no respiratory murmur can be heard on auscultation. There is, however, no sense of dyspnœa whatever during this period; and when respiration recommences it is not with a forcible effort, but, as already stated, with feeble, barely perceptible movements. The duration of the pause varies considerably in different cases; it may not exceed a few seconds, especially in children, or it may be thirty seconds, seeming so long, as Dr. Stokes observes, as to lead the bystanders to imagine that the patient is dead. Its length usually corresponds closely to that of the period of respiration. The successive periods of apnœa may be of equal length, or, as noticed in both of the cases here given, they may vary somewhat.

In apnœal periods of unusual length, spasmodic muscular movements have been observed, especially in the face or arms (Traube), or in the form of oscillation of the eyeballs (Roth, *Deut. Arch.*, vol. x., 1872, p. 310).

Secondly, the period of respiration deserves careful study. The number of respirations in each period varies much in different cases, and may vary somewhat even in the same case. Usually they are strictly on an ascending and descending scale, beginning with very feeble movements, progressively increasing until the climax is reached, and then decreasing gradually. But, as shown in Case II., they may stop abruptly, the breath immediately preceding the period of apnœa being a deep sighing one; this seems, however, to be rare. At the height of the respiration-period, the

breathing may have assumed the features of extreme dyspnœa; the vesicular murmur is much exaggerated, becoming strongly puerile in adults. In some cases the successive respirations become more and more close and hurried, in others they preserve the same rhythm, merely becoming deeper and more forcible.

In a case reported by Benson (*Dublin Four. of Med. Sci.*, vol. xlviii., 1869, p. 127), this form of breathing only occurred when the patient was in a semi-comatose state, and disappeared when she was roused. In some instances it has been observed to continue during sleep; while Laycock reports a case where the beginning of the apnœal period constantly aroused the patient just as he was dropping to sleep, and thus kept up distressing sleeplessness. On the other hand, Traube reports a case where in every pause in respiration the patient went to sleep, and awakened at the height of the dyspnœa.

Lastly, I would ask attention to the condition of the circulation during these alternating conditions of respiration, and particularly since the results of my own observations are at variance with those of some other authors on this subject. Dr. Reid, of Belfast (*Dublin Hospital Gazette*, 1860), who first showed that this form of breathing is not necessarily connected with fatty heart, also asserted that during the respiratory distress the pulse became invariably slow, increasing again in frequency during the apnœa. This was confirmed by Benson, Little, and Laycock. Thus, in one case (Little), during ten seconds of the breathing period there were six systoles of the heart, while during ten seconds of the apnœal period there were not less than fifteen systoles. But in both the cases I have here recorded, and in others which I have seen, it will be observed that after the apnœal period was established the pulse grew decidedly slower. This I believe to be the more usual condition, as it is certainly the one which would be expected if the theory of the causation of Cheyne-Stokes breathing which I shall briefly state below be correct. It also agrees with the experience of Traube, who says, "During longer pauses, the arterial tension often increases and the pulse decreases in frequency." Whether the opposite condition noted by the reliable observers above named was in any way connected with the organic heart-disease which I believe was present in all of their cases, may be a question worthy of consideration.

As the object of this article has been merely to call attention to the characteristics and important diagnostic value of this interesting form of breathing, the discussion of its pathology and causation must be postponed to a future occasion. It is sufficient to observe now that it evidently depends upon a paresis or state of impaired sensibility and activity of the nervous centres of respiration. In consequence of this, when the active respiratory movements have thoroughly oxidized the blood, the respiratory centre ceases to respond to the stimulus conveyed to it by the small proportion of carbonic acid in the blood, and consequently respiration ceases until the accumulation of carbonic acid becomes so great as to afford a degree of stimulation to the respiratory centre, chiefly through the branches of the pneumogastric nerves, sufficient to overcome its inaction, and then respirations are excited which continue until the decarbonization of the blood has reached a point where it no longer affords a sufficient degree of excitation to the nerve-centre, when another period of apnœa ensues.

The most obvious conditions in which this state of things may be present are: in cases of defective nutrition of the respiratory nerve-centres, as from impaired blood-supply; in cases of pressure upon the trunks of the pneumogastric nerves or upon the medulla, as from inflammatory exudation in tubercular basic meningitis, or from a tumor; and in cases where the blood is charged with morbid matters capable of exerting a depressing, quasi-narcotic, effect on the nerve-centres, as may be the case in uræmia.

TRANSLATIONS.

INTERNAL USE OF SALICYLIC ACID, PARTICULARLY IN ACUTE ARTICULAR RHEUMATISM.—Dr. L. Riess (*Berlin. Klin. Woch.*, 1876, p. 86), after trying salicylic acid in twenty-seven cases of acute articular rheumatism, concludes that this remedy is a decided antipyretic, causing improvement in the joint-trouble by lowering the temperature, and, on the whole, decidedly shortening the course of the disease. The occasional unfortunate results which have followed the internal use of salicylic acid

have led Dr. Riess to make use of the salicylate of soda, which, he says, experiment has shown to be as efficient as the acid itself. He uses this remedy in doses of 6.0 grm. (℥iss), and preferably according to the following formula:

℞ Sodii salicyl., ℥iss;
Aq. destillat., f℥v;
Syr. sarsp. comp., ℈iv.—M.

This mixture is well borne, and is rarely followed by vomiting. The salt may be made extemporaneously from the acid by a good apothecary. x.

Pathological Anatomy of Pemphigus.—Dr. I. Neumann reports the following case (K. k. Gesellsch. der Aertzl. in Wien: *Wien. Med. Presse*, 1875, p. 304):

The patient, after mild symptoms of angina, displayed upon the skin of the axillæ rough, uneven, coin-sized, excoriated patches, which rapidly spread, became generalized over the surface, and for a considerable time presented the appearance of a rare disease, the confluent form of cutaneous syphilitic vegetations (framboesia syphilitica). Later, pea- to hazel-nut-sized bullæ appeared, which burst, and the bases of which assumed the appearance of broad condylomata. After the affection had existed for six weeks, it presented the appearance of pemphigus vulgaris. The contents of the bullæ were at first serous and gummy, and the cuticular covering tense. Later, the contents of the bullæ were scanty and decomposed rapidly. The affection ended fatally. Microscopic examination of the skin of the axilla showed the following changes. The epidermis was in most places wanting; the cells of the rete Malpighii which were observed appeared swollen and infiltrated with molecular masses. The cylindrical cells lying next the papillæ were not altered any further; the papillæ themselves were decidedly enlarged. The vascular loops contained in the papillæ were mostly interwoven, their tissues swollen and pressed apart by cell-infiltration. Afterwards, infiltration was found in the upper layers of the cutis. The fibres of the cutis were swollen, spongy, and pressed apart by cell-proliferation. Their vessels were normal. Pigment was also observed occasionally distributed even into the papillæ. Hair-sacs were observed, but with the hair and its sheath removed. A few sebaceous glands were noticed. The sweat-glands were enlarged throughout. Their contents consisted of yellowish and brownish masses, probably necrosed gland-cells, together with a homogeneous opaque membrane. x.

Dermatitis Circumscripta Herpetiformis (I. Neumann: *Centralb. für die Med. Wissenschaften*, No. 5, 1876; from *Vierteljahrsschr. f. Dermat., etc.*, 1875).—Under the above title Neumann gives an account of a cutaneous disease, which he met with in nine cases, and which has not been previously described. Eight of the patients were males, the ninth a female, and they varied in age from 22 to 57 years. The affection has a resemblance to psoriasis, and also to lichen rubra, but differs enough from these to be noted as a special disease. It begins with an eruption of small pale-red spots, which in the centre are of a bluish-white color, and which increase very slowly at the periphery, so that several months elapse before the size of a small coin is attained. The patches of the eruption become larger and larger, the central portions of each patch remaining of a uniform red color, while on the circumference there are numerous points at which the color is wanting. The skin is perceptibly thickened, while the rash either becomes confluent or remains discrete. The amount of scales gradually increases and forms brownish crusts, which are tightly adherent, while at the same time the infiltration becomes less and leaves spots which are deeply pigmented. The disease may last for years, one eruption fading, with intense itching, to be followed by others. The pathological changes which are found in the skin are the following. Great increase in the epidermis and rete, and hypertrophy of the papillæ. The loops of the blood-vessels are wider than normal. The most striking changes are found in the sweat-glands, to which are due the white points which are seen on the periphery of the patches of the eruption. N. thinks that the disease should be regarded as a circumscribed inflammation, which affects principally the papillary layer, with involvement also of the perspiratory glands. The skin of the neck, face, and head always remained free from the eruption, while it was well marked on the back and extremities. The treatment consisted of friction with sapo viridis and inunction with tar; but several months usually elapsed before a cure was effected. No relapses occurred. W. A.

PHILADELPHIA
MEDICAL TIMES.

PHILADELPHIA, MAY 27, 1876.

EDITORIAL.

IN a previous editorial we called attention to the Subject-Catalogue of the National Medical Library, giving some reasons why the whole profession should feel a deep interest in its completion. To be a little more specific as to its scope and extent, we have selected, from the subjects contained in the specimen fasciculus, "Abortion." Under the general heading are catalogued one hundred and fifty books, pamphlets, and theses, the author, title, date, and place of publication, with occasionally other particulars as to the character or history of the book, being given. Of papers in journals, nearly two hundred are referred to; not always by their original titles, but by one which is descriptive of the contents of the paper, so that he who consults the list can tell at once whether the memoir touches upon the point, be it the statistics, treatment, causation, natural history, or pathology of abortion, which he is especially interested in. There is also a second general heading, "Abortion, Jurisprudence of," under which seventeen separate publications and ninety papers are catalogued.

As a specimen of the way in which authors are handled, under "Abercrombie, Jno.," we find two books, with the history of the American editions and of the translations into French and German, besides various pamphlets, and also references to the various biographical memoirs which have been written of him.

The importance of the task undertaken by Dr. Billings is evidently equalled only by its magnitude. When completed, the work is expected to occupy five large volumes, each containing one thousand double-column pages, much of them in very fine print. It must also be borne in mind that this gigantic labor is, on the part of Dr. Billings, a voluntary task, being in addition to onerous duties not only as librarian, but also on various special details, and a very large portion of it being done at night after official hours.

We have not, however, devoted so much space to the consideration of the subject for the purpose of giving Dr. Billings his well-earned meed of praise, but in order to do our part in stimulating the profession to consummate his labor by inducing Congress to publish the work. There are two ways of reaching Congress; and if the profession can only be aroused so as to act vigorously in both methods, the result cannot be doubtful.

The American Medical Association should appoint a committee to urge the matter upon Congress, and every State and even County organization should follow in the same track. But individual action is even more potent than that of societies. Let every doctor write an urgent letter to the representative of his district and to the Senators of his State, and our supreme legislators may wonder at the multitude of the M.D.'s, but surely will be little inclined to resist the popular verdict. We would especially urge all of our readers to do this. It makes little difference whether the physician has a personal acquaintance or not with the politician. It is a part of the business of the latter to know about every one of local eminence in his district, and sometimes the fear of an influence which is not sufficiently known to be measured is most potent.

THE State Medical Society meets at the First Reformed Church, Rev. Dr. Wylie, Broad Street above Pine, on Wednesday, May 31, at 3 P.M. The American Medical Association meets on Tuesday, June 6, at 11 A.M., at Horticultural Hall, Broad Street above Spruce.

PROCEEDINGS OF SOCIETIES.

PATHOLOGICAL SOCIETY OF PHILADELPHIA.

THURSDAY EVENING, FEBRUARY 10, 1876.

DR. WHARTON SINKLER in the chair.

CANCER of the pylorus. By Dr. J. H. HUTCHINSON. See original communication, p. 414, in current number of the *Times.*

A case presenting specimens of chronic catarrhal pneumonia; abscess of the right kidney; tubercular ulceration of the ileum, and disease of left hip-joint. By Dr. FREDERICK P. HENRY. Clinical History by Dr. Louis Starr.

"Annie D., 47 years of age, married, was admitted to the Episcopal Hospital on July 6, 1875. She had never had syphilis, had always been perfectly temperate, and had enjoyed fair health until the winter of 1874, when she began to suffer from pain in the left hip and thigh. The pain, which at first was paroxysmal and neuralgic in character, either excited or if present greatly augmented by movements of the limb, gradually grew constant and became associated with difficulty in walking. When admitted, there was considerable stiffness in the left leg, so that even with the aid of a cane she was able to walk but a short distance; there was a constant dull aching sensation in the left hip, and at times severe pain extending from this situation along the sciatic nerve to the knee; there was no swelling about the hip, nor any apparent difference in the size or length of the legs. Pressure immediately behind the trochanter major caused acute pain, but there was no pain on percussing the trochanter, and but little on flexing or extending the thigh. The patient was somewhat emaciated; her appetite and digestion were moderately good; there were no symptoms of disease of the heart or lungs, and these organs seemed on superficial examination to be healthy. The urine was carefully tested and found to be normal. After admission there was little change in her condition, except that the difficulty in walking increased, up to July 28, when the whole of the left leg became tender to the touch, and the foot and ankle œdematous. On August 15 there was marked œdema of the whole leg; the skin, especially on the posterior surface, presented a livid and mottled appearance, there was considerable pitting on pressure, great tenderness, and the temperature, as estimated by the hand, was lower than that of the other leg. No pulsation could be felt in the dorsal artery of the foot or in the popliteal artery, and very little in the upper portion of the femoral. No abdominal or uterine tumor could be discovered; the heart was found, by careful physical exploration, to be healthy, and the urine was again examined without any thing abnormal being detected. On September 7 the swelling in the left leg had greatly diminished, but there was a peculiar roundness of outline and distention of the tissues about the hip, with flatness of the left gluteal muscle. She rested constantly on the back or right side, with the left thigh drawn up towards the abdomen and adducted. There was constant soreness in the hip, and pain was excited by percussion over the trochanter or by flexing or extending the thigh. The neuralgic pain, however, had entirely disappeared. The right leg was swollen and presented the same characters as had already been observed in the left leg, though in a less degree. During the above interval (Aug. 15–Sept. 7) she had an obstinate attack of vomiting, which lasted four or five days, and was followed by great prostration. In the latter part of September she had a second protracted attack of vomiting, but in other respects her condition remained unchanged until October 12, when the wards were transferred and the case passed from my observation."

I am indebted to Dr. Starr for the foregoing history.

I took charge of the case on January 1, when I found the woman sitting up and in pretty good condition. She made no complaint of her hip, and only suffered from occasional attacks of diarrhœa which were readily controlled. She continued in much the same condition until within a few days of her death, when a somewhat sudden change for the worse occurred; this was characterized by great prostration and a tendency to syncope. Her death was typically by asthenia, the mental faculties being unimpaired until the last.

The subject of the above sketch was rich in pathological specimens. I have here the left lung, the kidneys, a portion of the ileum, and the head of the femur. The lung is far advanced in chronic catarrhal pneumonia; at the apex the parenchyma has broken down so as to form a small round cavity over which the pleura is somewhat thickened. The smaller bronchi are seen on transverse section to be thickened and dilated. Here and there the cut surface shows portions where the cell-infiltrated parenchyma is undergoing the caseous metamorphosis. The free surface of the lung is unevenly tuberous, portions of healthy tissue intervening between similar areas of indurated, darkly pigmented patches, in which the condition resembles the so-called slaty induration. These changes become less marked as we approach the base of the lung, which is congested, probably hypostatically.

We can form but a very imperfect idea of the air-containing power of this lung during life from its present condition. It is no exaggeration to say that the percussion-note over this lung was extraordinarily tympanitic. I cannot fully account for this fact, although the wasted condition of the tissues covering the thorax and the dilated condition of some of the smaller bronchi may help to explain it.

At any rate, there is no doubt that the inspiratory act was capable of conveying large quantities of air into this lung-parenchyma. This explanation of the percussion-sound would also account in some degree for the supposed deceptive post-mortem appearances of this lung; for air contained in small but dilated bronchi would, I think, be more easily expelled by atmospheric pressure than the residual air of the vesicles. I know of no other way of explaining the physical signs than by supposing that many of the bronchi leading to occluded vesicles were pervious, while others were in a condition of vicarious bronchial emphysema, and that the pressure of the atmosphere has been sufficient to expel the greater portion of the air contained in them.

The head of the femur is seen to be eroded. I am informed by the resident physician, Dr. Ziegler, who made the autopsy, that the bone was very easily removed, owing to its being almost dislocated. The joint-cavity was filled with pus.

There are several ulcerations in the ileum which are undoubtedly tubercular; this is shown by their direction, which is transverse, and by the secondary miliary eruption in the sub-serous connective tissue. One of these ulcers, by the induration of the tissues forming its base, has caused a decided stricture; nevertheless, there was no accumulation of fæces above this point, nor did the stricture occasion any inconvenience during life.

The most curious specimen, however, which this subject affords is the right kidney. This gland is converted into a sac encapsuling a quantity of mortar-like substance which replaces the greater portion of its proper structure. A portion of the ureter accompanies the specimen, and its lumen is seen to be obliterated. A fragment of the material contained in this kidney was shaken up with water in a test-tube, so as to form a milky emulsion, and a drop of this examined under the microscope: it consisted entirely of pus-cells and granular detritus, the result of their disintegration. Upon the nature of the pathological process giving rise to this abscess, I would not venture an opinion without further dissection of the gland: it may have originated in the parenchyma and opened into the pelvis, causing a secondary pyelitis and subsequent occlusion of the ureter, or it may have originated in the pelvis from obstruction in the ureter. The bladder was not examined.

The deposit is further interesting as bearing upon a mechanical property of the kidney, namely, elasticity. The original abscess, at its acme, must have occupied a far greater space than in its present inspissated condition, and yet the parenchyma, formerly so greatly distended, is now closely applied to the circumference of the abscess. The minute anatomy of the kidney may help to explain this phenomenon: the gland is almost entirely made up of secreting tubules and blood-vessels, both of these arranged in a very peculiar manner. The convoluted tubes of the cortical portion would appear, from their tortuous course, to be equally capable of yielding to a force which tended to approximate their extremities, or to one which tended to separate them still further, while the smaller blood-vessels, being themselves exceedingly elastic by virtue of their muscular coat, would, it is to be presumed, readily yield to a distending force. The resistance which would be opposed by the capillaries need not be taken into consideration, since these vessels are distinguished by their power of adapting themselves to circumstances. The subsequent recoil, or retraction, of the organ, is susceptible of a different explanation. It must be borne in mind that the ureter is occluded, and therefore with the absorption of the exudation there is, as it were, a constant tendency towards the formation of a vacuum, which is prevented by the retraction of the encapsuling kidney. It has clung to the disappearing exudation as the thoracic walls cling to the retiring lung. In short, there are three factors which may unite in producing such a result, namely, the elasticity of the organ, the suction-force above described, and perhaps some degree of cicatricial contraction.

In conclusion, the question arises whether there is any causative relation between these four different morbid conditions, and, if so, what is its chronological order?

The presence of tubercle, according to the latest researches in experimental pathology, presupposes the existence of some inflammatory focus. Here we have tubercle in the intestine, and *three* inflammatory foci, situated respectively in the lung, kidney, and hip-joint. Now, there are two methods of infection: one by way of the afferent vessels, the veins and lymphatics; the other, by the arteries: the former is more apt to be local; the latter, general. Is the former method possible here? On regarding the anatomical relations of the parts, the answer must be in the negative. The intestinal lesion, which we must regard as secondary, is of all the four the most peripheral. The second method of infection is the only one here possible. I am inclined to consider the lung as the primary inflammatory focus, and the morbus coxarius and intestinal ulcers as the result of a general blood-infection of somewhat less virulence than pyæmia. Such, as is well known, is the present doctrine of the nature of tuberculosis. The resemblance to pyæmia is brought out in a very striking manner by the resemblance of one of the secondary lesions to one of the most common in the pyæmic process. I refer to the suppurative arthritis. I consider the kidney-disease as independent of the three others which I have thus associated.

I omitted to mention in the proper connection that I found no albumen in the urine of this patient, and that the left kidney appears

to be fatty. The excretion of urine seems to have been properly performed by one diseased kidney.

Dr. SINKLER said the patient was under his care from October, 1874, to June, 1875. From December she had had a troublesome cough with fever, but there were no physical signs of organic trouble in the lungs. It may be that it was at that time that the phthisis began, although the patient appeared entirely to recover, and there was no cough when he went off duty.

Dr. M. O'HARA desired to know something more about the relation of the physical signs, as reported by Dr. Henry, to the condition of the lung found after death, and what had been the diagnosis.

Dr. HENRY said he was at a loss to explain the physical signs otherwise than he had done in his paper just read. He knew of no condition except emphysema which could give so general a resonance as was afforded by the chest of this patient before death.

Dr. JOHN GUITÉRAS said that in all cases of solidifications in which he had found tympanitic percussion it was on the left side, and he had thought it was due to the conduction of the tympany of the stomach. So most of the cases which he had read were those in which there was a pneumonia of the left side. Walsh, however, reports two cases of right-sided pneumonia, in which the tympanitic percussion was present, and he attributes the sound to an exudation of air into the pleural sac without any perforation of the pleura. Even in acute pneumonia it is sometimes present. In two cases which had come under Dr. G.'s observation, the tympanitic resonance was so marked that the idea of pneumothorax suggested itself; and in one case particularly there was well-marked metallic tinkling, the cause of which he determined to be connected with the distended stomach, by observing that it occurred only during deglutition.

Dr. Guitéras said he had been studying somewhat this subject of tympanitic resonance in connection with solid lungs, and had come to the conclusion that the degree of tension of the chest-walls has much to do with it. If a healthy resonant chest-wall be selected, and the two hands be laid against it with a degree of force sufficient to prevent its vibration, the percussion-note is immediately deadened, showing that the resonance is produced by the vibration in the tense membranous wall itself. Now, if there be a distended lung and a distended stomach below a consolidation, we have in the chest-wall and abdominal wall covering both a continuous tense membrane which gives rise to a tympanitic note.

Dr. HENRY said the percussion was tympanitic on both sides.

Dr. GUITÉRAS said that if it was present on the right side he would consider it due to vicarious distention of the healthy lung.

Dr. HENRY said with regard to pressure upon the chest-walls, he thought it was the universal opinion that it was vibration in the chest-walls that caused resonance, and that pressure upon the walls, interfering with this vibration, impaired the resonance.

Dr. GUITÉRAS said that many teachers had taken pains to prove the contrary, and it was very interesting to read Dr. Skoda's account of his experiments on this subject, his object being to prove that the resonance was only due to the air within the chest-wall, while Dr. Williams, of London, tries to show that the cause is to be found in the membrane. Skoda says that the thoracic wall cannot produce the percussion-note, because portions of this wall when detached prove not to be sonorous. But Dr. G. thought that Skoda, by doing this, deprived these portions of the conditions which made them sonorous; they were no longer stretched over an elastic skeleton forming a sonorous box. Skoda would also find it impossible to make any amount of air vibrate into sound, without placing it under certain favorable circumstances.

Dr. HENRY remarked that the vibrations of the air within the thorax are, of course, secondary to the vibrations produced by percussing the chest-walls. When a tuning-fork is struck, it is the vibrations of the air that excite the sense of hearing, produced by the movements of the tuning-fork; we cannot separate one from the other.

Dr. JAS. C. WILSON said it seemed to him that in the consideration of this question of tympanitic resonance, it must be remembered that percussion-resonance is due to two factors: one, the vibration of the volume of air within the chest, and the other, the vibration of the chest-wall itself. It is to be borne in mind that the air within the chest-cavity is held there by lung-tissue in a condition of distention, that there is an amount of tension on the inside, as is proved by perforating the chest-wall in the cadaver, an operation followed by entrance of the air and collapse of the lung. The collapsed lungs yield on percussion no longer the normal resonance, but a more or less decidedly tympanitic note. Herein lies the explanation of tympanitic resonance in congested, and even pneumonic, lungs. In this condition, more or less of the air-vesicles being occluded, the air is thus expelled from the lungs, and the state of natural tension no longer exists; consequently, the condition of the whole mass of the chest-wall and the contained air-vesicles becomes analogous to that of the lung when air has been admitted into the pleural cavity.

Dr. GUITÉRAS said that by the exudation of inflammatory products into the lung-tissue the solid contents of the chest-cavity are increased, and instead of the collapsed condition you have rather a distended one. If, at the same time, there is sufficient air to allow of vibration of the chest-wall, you get

a note on percussion which is tympanitic, while if there is not sufficient air you get a dull resonance.

Dr. WILSON said the clear percussion-note is due to the fact that the air-vesicles are distended; but as soon as the whole mass of lung-tissue is in the state in which the walls of the air-vesicles are no longer distended, you have the very condition demanded for the production of a tympanitic note. It seemed to him, also, that this line of thought would point out the best explanation of the tympanitic resonance overlying pleuritic effusion. By reason of pressure, the normal tension of the lung-tissue is done away with, and there results a flaccid condition of the cavities.

Dr. GUITÉRAS said, in connection with pleural effusion the importance of the vibrations of the chest-wall is very great. When the surface of a vibrating membrane is diminished, we have a higher note; so when we have effusion, the portion of the chest-wall in front of the fluid is prevented from vibrating, and above it you throw into vibrations a smaller area of membrane, producing a tympanitic note. While upon this subject, he desired to ask the members of the Society what the German authors meant by the *tympanitic percussion-sound*. They constantly speak of tympanitic percussion as being always present over the consolidated lung of acute pneumonia, a statement that you never hear from American or English teachers.

Dr. WILSON stated that Paul Niemeyer explains it as follows. The physical conditions which give rise to tympanitic percussion are these: a volume of air in sufficient quantity contained in a space of which the walls are not too tense. The conditions may be illustrated by a bladder containing water and partly filled with air; such a bladder will give on percussion a tympanitic note. If now you continue to inflate the bladder until the walls are tense, you no longer have on percussion tympanitic resonance, but a dull note. The *quality* of the *tympanitic* and that of the *clear* note are essentially different.

Dr. HENRY said the real question of interest was this, namely, what was the condition during life of this *individual* lung? Does its present indurated condition represent that which then existed? He could not think so; being convinced that such an amount of consolidation could only give rise to a dull percussion-sound. The conditions during life must have been widely different. In his paper he had broached the theory that the air, giving rise to the tympanitic resonance, had been contained in dilated bronchi, which air has been expelled by atmospheric pressure. A condition of dilatation and perviousness of the smaller bronchi may even co-exist with an occluded state of the vesicles to which they lead; such a condition, according to the modern doctrine of catarrhal pneumonia, being produced by inhalation of secretion. This condition is found in the catarrhal pneumonia complicating measles.

Dr. HUTCHINSON said that even in cases where the right was the lung involved in the inflammation, and where consequently the sound could not be referred to conduction from a distended stomach, tympanitic resonance of high pitch was, in his experience, frequently obtained by percussing over the front of the chest. He considered the sound to be tympanitic in quality, although it was undoubtedly of much higher pitch than the stomach-note, which was generally accepted as the type of tympanitic resonance. It resembled more closely the sound obtained by percussing over the intestines, and he was, therefore, inclined to attribute it to the vibration of air in the bronchial tubes, the solidified lung acting as a good conducting medium.

Mitral and aortic disease; pleurisy with effusion. By Dr. W. H. PARISH.

A. B., aged about 50 years, entered St. Mary's Hospital about February 5, with general œdema, slight peritoneal effusion, evidences of fluid in both pleural cavities, especially the right. Both lungs filled with small bubbling râles. Respiration frequent, imperfect, and labored. Slight cough. Pulse full, frequent, and irregular. Heart's impulse feeble; its action irregular, intermittent; its sounds feeble, the first sound being accompanied with a blowing murmur.

Condition grew worse constantly, and death occurred on February 7, from failure of heart's action.

Autopsy by resident physician, Dr. A. Parish. Peritoneal effusion; œdematous condition of lungs; serous effusion slight in left pleura; a pint or more in right pleura.

Heart enlarged; left ventricle dilated; atheroma of mitral and aortic valves.

Dr. JOSEPH G. RICHARDSON said the case was one of great interest to him. The patient first consulted him about a year ago, when he found a bellows murmur replacing the first sound of the heart, indicating almost complete insufficiency of the mitral valve. He told him there was a little trouble about the heart, and that no one could entirely cure him. The patient then informed Dr. R. that twenty years ago, in Dublin, Drs. Stokes and Sir Dominic Corrigan had made the same diagnosis, and from that time to this he had dyspnœa on taking cold or on moderate exertion. He was, however, dissatisfied with the opinion Dr. R. gave him, and selected a homœopath, under whose care he continued several months. About three weeks since, he again sent for Dr. R., and was found suffering from an attack of pleurisy of the right side, from which he improved, until he got up one night and went down into the yard partly dressed. The result was a severe relapse of the pleurisy, under which he gradually grew worse, and was finally removed to St. Mary's Hospital. He thought

it might be said that it was a combination of the cardiac disease, pleurisy, and bronchitis, which caused the fatal termination.

1. *Unusual form of scirrhus of the mammary region.*
2. *Lymphoma of the submental region.*
3. *Enchondroma of the nasal septum.*
4. *Papilloma of the hand.*
5. *Melanotic growth from the groin.*

By Dr. JOHN ASHHURST.

1. *Unusual form of scirrhus of the mammary region.* This tumor was removed from a woman, 66 years of age, on August 5, 1875. The growth occupied the outer portion of the left mammary region, but did not seem to be directly connected with the gland. The central portion of the tumor presented a peculiar, glazed, papillary appearance, resembling prominent granulations, except in that the cuticle appeared to be unbroken. The patient had been aware of the existence of the tumor for about six months, and averred that she had a similar growth removed by means of caustics some years before, though she bore no cicatrix to substantiate the statement. The mass was removed by excision, and, as a precautionary measure, it was thought prudent to take away with the tumor the adjacent lobe of the mammary gland. The patient made a good recovery.

Dr. Bertolet was kind enough to make a microscopic examination of the specimen, and, on September 9, 1875, wrote to Dr. A. that "The mammary tumor must be classed as a carcinoma simplex (scirrhus). It presents a preponderating connective-tissue stroma, with irregularly-shaped epithelioid cells in its meshes. The contents of many of the alveoli are far advanced in the stages of fatty metamorphosis. No cancerous elements were detected in the adjacent lobe of the mammary gland; but there is evidently a slight hypertrophy of the connective tissue."

2. *Lymphoma of the submental region.* This tumor was removed on the same day as the preceding specimen, August 5, 1875, from a young woman 20 years of age. The growth had existed about a year and a half, and more than one attempt had been made to remove it,—these attempts, however, having apparently accomplished nothing more than the evacuation of a cyst which occupied the lower portion of the mass. The tumor was removed by means of a single, straight incision, and the specimen submitted to Dr. Bertolet, who, on September 30, reported that "The tumor from the submental region presents the characters of a lymphoma. Its central portions have undergone caseation, and contain naught but pus-corpuscles and granular débris." The patient recovered rapidly.

3. *Enchondroma of the nasal septum.* This specimen was removed from a young man of 18, on February 1, 1876. The left nostril was almost entirely occluded by a solid growth, and the expansion of the nasal bones was already so far advanced as to produce the characteristic deformity known as "frog-face." The tumor had existed as long as the patient could remember, but the disfigurement had only become sufficient within the last six months to make him anxious for the removal of the disease. The mucous membrane covering the tumor having been divided, the whole mass was removed piecemeal through the nostril by means of a probe-pointed knife and gouge. The growth had a broad attachment to the cartilaginous septum in part and to the vomer posteriorly, and in its undivided condition was of the size of a hickory-nut. A microscopic examination of the tumor, kindly made by Dr. Nancrede, showed, as had been anticipated, that the growth was an enchondroma. The result of the operation was perfectly satisfactory.

4. *Papilloma of the hand.* This specimen, which was removed by excision from the ulnar side of the hand of a female child, was chiefly interesting as being an example of the form of papilloma called by Billroth "horny excrescence," which, as was well known, was more apt to occur on the face or scalp, and in advanced life, while the common wart was oftener seen on the hand and in young persons. The growth was of a dark brown, almost black color, but this was probably due to the occurrence of interstitial hemorrhage rather than to the presence of true pigmentation. The wound left by the operation healed by granulation.

5. *Melanotic growth from the groin.* This specimen was removed from a young girl of 16, the growth having been of congenital origin; at first appearing as a "red spot" (probably an ordinary mole or nævus maternus), but at the age of thirteen having become prominent and the seat of a discharge. The tumor was of a dark-brown color, and presented a peculiar warty or papillomatous appearance. It involved the skin only, and was removed by an elliptical incision. The progress of the case, since the operation, has been perfectly satisfactory. Dr. Nancrede has been so kind as to make a microscopic examination of the growth, and reports it to be distinctly epitheliomatous in character. The specimen is interesting as illustrating the development of malignant disease in the seat of an innocent growth of long standing.

Gummy tumors on the liver. By Dr. JOHN M. KEATING.

These specimens were taken from a patient, aged 40, who had long been an inmate of the Philadelphia Hospital, at first as an assistant, finally as a patient. The history of the case was an ordinary one of hepatic cirrhosis coming on in a person who had been addicted to the abuse of alcohol. He positively denied any history of syphilis. The particular interest attached to the specimen is due to the gummy-like tumors which are seen here and there throughout the liver, and which seem

to indicate for the cirrhosis a specific cause. The specimen was referred to the Committee on Morbid Growths, which reported, February 24, 1876, as follows:

"The microscopical structure of the abnormal growths found in the liver presented by Dr. Keating consists of a central mass of closely-packed granular débris and fat-granules, amongst which may be seen an exceedingly scanty fibrillated tissue. Surrounding this, and directly joined with it, is a more completely fibrillated structure, whilst the peripheral portions of the growth, which are continuous with the surrounding hepatic substance, consist entirely of fibrous material and small, round cells,—the granulation or 'indifferent cells' of authors. The growths, therefore, are to be classed under the gummata."

REVIEWS AND BOOK NOTICES.

AN INTRODUCTION TO PATHOLOGY AND MORBID ANATOMY. By T. HENRY GREEN, M.D. London. Second American from the Third English Edition. H. C. Lea, 1876.

In the review of the first American edition of Dr. Green in the *Times*, we spoke of it as "an excellent work," and have seen no reason since to modify this opinion. The present edition has been somewhat enlarged in the text, and made more valuable by the addition of a number of excellent wood-cuts.

A TREATISE ON THE DISEASES OF THE NERVOUS SYSTEM. By WM. A. HAMMOND, M.D. Sixth Edition. Rewritten, enlarged, and improved. New York, D. Appleton & Co., 1876.

This book, which purports to be the sixth edition of Dr. Hammond's work, differs from its predecessors in not having the aspect of being a reprint from old stereotype plates. Some publishers, it is rumored, have the habit of striking off a few hundred copies of a book as wanted for sale, and calling each successive printing an edition, for the edification of the buying public. Somewhat the same spirit possessed the breast of an eminent conchologist, who, in a moment of fatuous confidence, revealed to us the secret of his enormous collection of shells. "It looks well," he said, "to talk about Number 10,006 of your collection. So I just commenced with Number 10,000."

The original treatise of Dr. Hammond, although in many cases excessively roseate in the hopes which it held out as to the effects of treatment, had many points of excellence; and these certainly have been increased in the present issue. A great deal of work has evidently been put upon the volume, and been placed wisely and judiciously. There seems to be at present no book on the subject in the language which can in any way compete in completeness and thoroughness with that before us, and we commend it most highly to the attention of our readers, with the simple note of warning, for them not to be disappointed, and not to think their own skill so inferior, if, in applying its precepts, they fail to get the results which the text has led them to hope for.

GLEANINGS FROM EXCHANGES.

NOTES ON THE PATHOLOGY AND TREATMENT OF SOME FORMS OF HYSTERICAL DISORDERS (Eugene Dupuy, M.D., in *The New York Medical Record*).—If hysteria in some of its severe paralytic forms is very intractable, it is by no means unamenable to therapeutic agents. It is well known that some cases of contracture, more frequently of the lower limbs, will, after long duration, simulate all kinds of malformations, and, when the muscles have undergone wasting, leave, as a sequel, a useless limb.

But what is the nature of the disease? or,—in order to be in accordance with the majority of contemporary pathologists, who think that all diseases must, in every case, have their *fons et origo* in the same organ,—where is the seat of the malady? If a very great number of high authorities see a connection between abnormal states of the female generative organs and the development of hysteria, many others, invested by common consent with just as high authority, deny any such connection. A theory which is now gaining ground in France, and which does not lack ingenuity, originated with Professor Charcot. He, after carefully comparing the phenomena of hemianæsthesia, hemiplegia, etc., etc., usually associated with certain forms of hysteria and similar symptoms, which, according to him, are always met with in destructive diseases of that part of the middle encephalon called the internal capsule, believes that that part of the cerebral organs is the seat of hysteria in its hemiplegic form at least. The study of cases of lesions of the pons Varolii, both in male and female subjects, caused by most diverse diseases, and in which I have very often observed hysterical symptoms, causes me to doubt. These symptoms have been well studied by my friend Dr. E. C. Seguin. He thinks that they depend upon various lesions, more especially of the right hemisphere of the brain, a view put forward by De Fleury, of Bordeaux, in his work on the Comparative Dynamics of the Cerebral Hemispheres, some years since. This opinion, and the assertion that some hysterical symptoms have been observed in diseases of the pons, by Bastian, of London, in his treatise on Paralysis from Brain-Diseases, together with a pretty numerous series of experiments on dogs and cats, permit me, I believe, to state that, very likely,

hysterical phenomena are dependent upon the abnormal state of either lateral portion of the upper part of the pons Varolii.

The diagnosis of the disease is not, as a rule, a very difficult one, except, perhaps, when it attacks very young males and females,—in which case it may be mistaken for coxalgia, so-called idiopathic contractures following convulsions, wasting of infantile paralysis, club-foot dependent upon organic disease of the spinal cord, etc. But if it is sometimes difficult, when the deformities have been long standing, to discover what is their origin, it is, however, not absolutely beyond our means; careful consideration of the habits of the little patients and of the onset of the disease will help us a good deal to clear the obscurity. But of this, more hereafter. When the paralysis occupies the upper limb or one side of the body in adult patients, it is much more often the left side. Sometimes the minor symptoms will almost give rise to the suspicion that hemorrhage has taken place in the brain; but the state of the pupils, which are dilated in hysteria, and slightly respond to light; the non-deviation of the tongue; the non-alteration of temperature, or its lowering below the normal degree; the loss, in a greater or less degree, of sensation in the paralyzed parts, will help us to come to a correct differential diagnosis. When contractures are present it will be easily seen that we have not to deal with hemorrhage or coarse lesions of the brain, from the fact that if we try to push the extended arm by pressing on the palm of the hand in such a way as if to push the limb behind the shoulders, or perform the same operation on the sole of the foot, pushing the leg in the axis of the trunk, we will detect, particularly if the disease is of long duration, the peculiar shaking common to every form of sclerosis. This aspect of hysteria, as pointed out by Professor Charcot, is due to secondary fasciculated sclerosis of the lateral column of the spinal cord, which, however, he distinguishes from what he has called amyotrophic sclerosis, by the fact that in the last-named disease the cells of the anterior horn of the spinal cord are primarily affected, while in the hysterical wasting under consideration the cells become affected only as a consequence. Moreover, in all the hysterical shams, however chronic, of muscle-disease, galvanic electricity gives rise, both through nerve and directly, to contraction, which it is well known does not take place in the genuine diseases. If we have to deal with contractures of parts only of muscles of the lower limbs, the diagnosis is sometimes more troublesome. To say nothing of the many means which individual ingenuity can suggest, one at least will always settle the case, provided there has not already been a complete wasting of muscles; and that is inhalations of ether or chloroform, and perhaps nitrite of amyl, but chiefly the exhibition of chloral hydrate, in full doses. Indeed, by that means it is almost always certain that we shall discover if we are dealing with hysterical mimics of organic diseases of the nervous centres.

In every case, of course, it is most important to know the history of the disease; and if we have to treat children, one of the first points to make clear is, whether they are not addicted to onanism or irritative practices upon the genitals. I have lately seen in Paris a girl eleven years old, not yet menstruated, who presented a deformity amounting to atrophy of some muscles of the leg, and club-foot, which could be ascribed to no other cause than that stated above. She is actually highly hysterical.

But it is not enough to try to find out what the characters and features of hysteria sometimes are; by far the most interesting point is the treatment. If in a very great number of cases of hysteria the physician has to resort, through failure with all else, to so-called moral treatment, I must say that in the forms of the disease of which I have been speaking, he will run great risk of allowing permanent impairment of some limb of the patient. Moreover, if the physiological process of the disease be such as I have tried to establish, it is not unreasonable to resort to therapeutical agents, which former experience has taught to be of service in similar conditions. I have sometimes been lucky enough to relieve a few patients suffering from paralysis of motion and sensation, by the use of strychnia, steam-bath, massage, and generous diet. In a long-standing case, I tried the actual cautery, applied on the nape of the neck, but perhaps the "emotion" of the patient did all the curative work in this instance. When there is contracture, it will be made to disappear by the use of chloral hydrate, exhibited every other night, and steam-bath on the intervening days, the cold douche only to be applied to the head and neck. The spinal hot-water bag is more efficacious in some cases where only the lower limbs are implicated. Of course, the continuous current of electricity has to be employed; but, just as with faradic electricity, it will be found to be of little avail except when directed against the wasting of the muscles. By far the most effective treatment, and chiefly so when there is the shaking, indicating sclerosis of Charcot, consists in large doses of strychnia, and alternately of iodide of potassium, in not more than four- or five-grain doses of the latter, and the application of the actual cautery. I have employed this latter agent, after the manner adopted by Brown-Séquard. It must be used every other day, and, in order to be able to do that and also to assure success, the iron must be heated to whiteness and only allowed to touch the skin, which then peels off just as if scratched very slightly by the nail,—and the touches must embrace a pretty large surface in length,—on the two sides of the spinal processes.

We must not forget, however, that in some instances of pretty frequent occurrence, all these symptoms will vanish on a sudden with the accompanying circumstances, and such phenomena are generally described as cases of miraculous cures, but are also daily met with in practice. I need not say, in dismissing this subject of hysteria, that all these therapeutical means will be found of only temporary efficiency if the primary cause of the disease is not got rid of, whether it be seated in the genitals, the reproductive organs, the viscera, or the nerves or nervous centres.

PERFORATING WOUND OF ABDOMEN, WITH PROTRUSION AND WOUND OF INTESTINE: RECOVERY (*The Lancet*, February 12, 1876).—Mr. Crosse reports the following interesting case: A man, aged 26, received a wound of the abdomen three-quarters of an inch in length, and situated about half an inch above the left groin. Through the wound there protruded a large knuckle of intestine, which was found to be wounded in three places, one about three lines long, in the longitudinal direction of the bowel, near its attachment to the mesentery; another, about a line in length, was at the opposite side; while a third, only a mere puncture, was situated about half an inch above the second one. The two larger wounds were sewn up with carbolized-gut sutures, and the intestines, having been carefully washed, were returned; the outer wound was closed with a continuous suture of carbolized gut, with a pad of dry lint over it. Opiates were freely administered; he was kept on a diet of milk and lime-water, cold beef-tea, and ice, and recovered completely in about two weeks, having had no serious trouble except an obstinate hiccough and some tympanitis.

In connection with this case, the two following are of interest. Mr. Haddon reports the case of a man, aged 27, who was gored by a bull. There was a lacerated wound of the abdomen, extending from about the centre of the left groin for five inches towards the umbilicus, and through which a considerable quantity, estimated at about six or eight feet, of small intestine protruded. The intestines, being uninjured, were carefully sponged with warm carbolic lotion, and returned into the abdomen. The wound was brought together by carbolized sutures, the peritoneum muscles being adjusted by deep sutures with as much accuracy as possible. The patient was placed under chloroform whilst the sutures were being put in. The wound was dressed antiseptically. Some hiccough occurred in the evening, but this ceased on the patient's vomiting the contents of his stomach. The treatment consisted in the administration of small quantities of opium. The urine was drawn off regularly. The patient took milk and fluid food. There was some sloughing of the superficial portion of the wound, which necessitated the application of a poultice. The patient made a good recovery.

Mr. Harrison reports the case of a man, aged 23, who, in consequence of an accident to some machinery, had an iron rod twelve inches in length and an inch in diameter thrust violently up his anus.

On admission to the hospital there was a lacerated wound on the posterior margin of the anus, which was continued upwards along the corresponding wall of the bowel as far as the finger could reach. The sphincter and mucous membrane of the bowel were completely torn through. Midway between the umbilicus and the centre of the left groin was a swelling about as large as a hen's egg. The swelling had evidently been caused by force from within, as there was no external abrasion of the skin. The bladder and urethra were uninjured. The patient was much collapsed on admission, and vomited soon afterwards. An acute attack of peritonitis very nearly proved fatal. The abdominal contusion suppurated and discharged pus, but there was no escape of fæcal matter. The patient recovered, and subsequently applied at the hospital in consequence of a hernial protrusion at the part where the abdomen was injured. For this he was fitted with a truss.

It was clear that the abdominal parietes had been almost perforated by the rod, and, as suppuration occurred, it was somewhat remarkable that no escape of fæcal matter took place, especially as the nature of the accident and the subsequent peritonitis warranted the conclusion that rupture of the bowel must have taken place.

THE RATIONAL TREATMENT OF CHOLERA (Surgeon G. C. Roy, M.D., F.R.C.S.: *Indian Medical Gazette*, March, 1876).—The principal features in cholera are the alvine flux and the algid condition of the body. The other symptoms are of secondary consequence. Now, to what is this flux due? Under the old view that it was an effort of nature to throw away a morbific poison from the system via the alimentary canal, the attention of the profession was directed to the intestines and the blood, and established many eliminative and retentive systems of treatment. It is, however, agreed on all hands that the early administration of opium often checks or cuts short the disease. It has remained a vexed question of the day, why the taking up of the poison is attended with improvement in the general condition of the patient. The fact is that the flux is not an active, but passive elimination, and opium acts otherwise than a mere astringent. The materies morbi of cholera affects principally the ganglionic system governing the pulmonary circulation, just as in asthma the irritation is mostly felt in the nerves supplying the pulmonary air-cells. Why the poison is so selective in its locality, is more than medical science is in a position to say. Starting from this pathological point, the explanation of the phenomena observed before death in cholera becomes an easy one. At post-

mortem examinations of cholera cases the lungs appear shrunk and exsanguine, while the branches of the pulmonary artery up to their entrance into the substance of the lungs are distended with dark, tarry blood. In fact, there is a general stasis of the venous circulation, as if produced by a cord tightly stretched across the pulmonary artery.

The liver, intestines, and brain are congested, but the lungs are of a lighter color and fully crepitant. As a result of this sudden venous stasis, the vessels relieve themselves by a copious flux through the mucous surface of the alimentary canal, the epithelium being discharged with it. While this obstruction is telling on the organs behind it, other serious changes are going on in the vessels and organs in front. The lungs are pale and bloodless. There is patency of the bronchial tubes, but there is blood wanting for aerification, which produces a feeling of constriction of the chest and dyspnœa. The left ventricle goes on pumping into the systemic vessels an insufficient quantity of blood, and even that is not in a fit state to support the vitality of the organs. If the constriction does not yield, the action of the left ventricle stops for want of duly oxygenized blood, and life becomes extinct.

The constriction of the pulmonary artery being the principal seat of illness, it is there that we should lead our charge. During the outset, opium is confessed to be an invaluable remedy. It acts in two ways,—1st, as an astringent, but chiefly and principally on account of its virtue in relaxing the nerves governing the capillary circulation of the body and lungs. If opium be combined with a stimulant which will support the heart's action, we have a remedy that counteracts the morbid condition that produces death in cholera, and its efficacy in the early stage of the disease is verified by experience. Later on, morphia and other allied remedies that paralyze the walls of the capillaries should be thrown into the circulation. If prompt action is necessary, intravenous injection is to be decidedly preferred. Brandy and soda can be given by the mouth, morphia by intravenous injection, and chloroform by inhalation.

TREATMENT OF RHEUMATIC FEVER BY SALICYLIC ACID (Dr. Broadbent: *Lancet*, April 8, 1876).—Numerous cases of this disease have been recently treated with this drug in St. Mary's Hospital, and in all of them the result was most satisfactory.

The cases reported speak for themselves, but it may be stated that they were all well-marked examples of acute rheumatism, and that two of them were of more than average severity. The results of the treatment of rheumatic fever by salicylic acid in the practice of Stricker, of Berlin, were so remarkable that the earliest opportunity was taken of bringing the drug to the test of experience. The mode of administration recommended by Stricker is that twenty to thirty grains be given every hour for six doses; but at the first trial at St. Mary's only seven grains and a half were given at each of the six hours, simply suspended in water. No bad effects being observed, the dose was increased. According to present experience, rheumatic fever when treated by this drug is an affair of two or three days. The disease is common enough, and its usual course is sufficiently well known, so that no long time will be required to establish some definite conclusion and to bring out any possible injurious effects. The only complaint hitherto made of the acid is that it is hot and irritating to the throat; given in milk, vomiting has been produced.

Several cases of the same disease have been recently treated in the same way by Dr. Trau, at the German Hospital in this city, with similar good results.

TRAUMATIC SEPARATION OF THE SYMPHYSIS PUBIS, WITH FRACTURE OF THE FEMUR (George W. Gay, M.D.: *Boston Med. and Surg. Journal*, April 13, 1876).—A man, aged 24, while intoxicated, fell from the waterspout of a house—into the second-story window of which he was attempting to enter—down upon the sidewalk.

The following injuries were found on examination. The right thigh was broken at the middle of the shaft. The symptoms were crepitus, shortening, eversion, and a distinct hinge at the point of injury. The patient had complete retention of urine, with hemorrhage from the urethra. Bloody urine was drawn with the catheter.

Swelling and tenderness were present in the right groin, extending from the symphysis pubis half-way to the anterior superior spine of the ilium. The point of greatest tenderness was at or near the symphysis. The right side of the pelvis was movable, but there was no crepitus. When the right ilium was pressed backward, the pubic bones could be easily separated to the extent of half an inch. The diagnosis of the pelvic injury was a separation of the pubic symphysis, with a loosening of the right sacro-iliac articulation. The fracture of the femur was treated in the usual way, with coaptation splints and extension. The urine was drawn every six hours the first day or two, when the patient passed it voluntarily, and had no further trouble of that kind.

In a little less than three weeks, a broad firm pelvic bandage was applied, to keep the pubic bones in as close apposition as possible. The bandage was not applied earlier, as the pressure on the great trochanter disturbed the position of the fragments of the femur.

The extension was removed from the thigh after twenty-five days. There was barely half an inch shortening. The union was quite firm.

The patient was discharged from the hospital at the end of seventy-four days. He

could walk without the aid of crutches or his pelvic bandage. The union of the pubic bones was so firm that no motion could be detected, and he felt neither pain nor weakness in attempting to walk. He was advised to keep quiet a month, and wear his bandage several months longer, to insure a perfectly strong and lasting union at the symphysis.

MISCELLANY.

FISH flour is prepared in Norway from dried codfish thoroughly desiccated and then ground in a mill. There are two qualities, the coarse- and the fine-ground. It is especially the former which has found favor with the public: from it an excellent dish of preserved fish can in a short time be prepared; while the finest ground is used for fish-puddings, a dish highly appreciated in Norway and Sweden.

DEATH FROM FRIGHT.—According to the *Medical Examiner* of April 27, the death of an inn-keeper occurred recently in London from fright, due to his erroneous belief that he had accidentally taken a fatal dose of poison.

Dr. TOLDT, Extraordinary Professor of Anatomy and Physiology in Vienna, has accepted a call to the corresponding chair at Prague, which has heretofore been filled by Professor Henke, now in Tübingen.

THE Supreme Court has decided that the Hot Springs of Arkansas, with the surrounding region, belong to the United States, and not to the persons who have held the title for many years.

PROF. TRAUBE, whose obituary we published some time since, because some of our German exchanges had announced his death, is now stated to have veritably died April 11.

A CONGRESS of cremationists is to be held in Dresden on the 6th and 7th of June.

IN 1875, the number of women studying medicine in Russia is stated to have been 171.

NOTES AND QUERIES.

THE POLITZER COLLECTION OF SPECIMENS ILLUSTRATING THE NORMAL AND PATHOLOGICAL ANATOMY OF THE EAR.

Dr. ADAM POLITZER, Professor of Otology in the University of Vienna, has sent to the International Exhibition of Philadelphia a very fine collection of specimens illustrating the normal and pathological anatomy of the human ear.

There are forty-nine specimens in all, of which forty-four show the temporal bone in various conditions. Each specimen of the temporal bone is mounted on a black pedestal, and covered with its own miniature bell-glass.

The remaining five specimens are larger, and illustrate the relation of the ear to the base of the skull, and the muscles of the soft palate and Eustachian tube. These are mounted on black tablets without bell-glasses. The entire exhibit of forty-nine specimens of the human ear is arranged in a handsome black case, shaped like a desk, the lid of which is glazed.

The specimens are arranged on four steps and on the floor of the case. The specimens of the temporal bone occupy the steps, eleven on each, and the larger preparations lie on the space in front of the last step.

Accompanying this exhibit is a set of plaster casts of some of the diseases of the membrana tympani.

It has taken Professor Politzer two entire winters to make these preparations, and many of them might be called marvels of skill and beauty.

Only he who has ever made any endeavor to dissect a temporal bone can have any adequate idea of the time and patient toil it has required to make this collection.

The productions of Professor Politzer's skill can be seen in P 28, Austrian Section, Main Building, International Exhibition at Philadelphia. The entire collection which this distinguished otologist has sent to America should be seen by every educated physician who visits the Centennial.

I understand that the College of Physicians has secured the refusal of this collection, and sincerely trust that it will not be allowed to leave this city.

C. H. BURNETT.

127 South Eighteenth Street.

Dr. WILLIAM GOODELL will deliver an address before the Philadelphia County Medical Society, as retiring President, at the Hall of the College of Physicians, Monday, June 5, 1876. Medical gentlemen in the city are invited.

The subject is, "A Midwife of the Olden Time; or, A Sketch of the Life of Louyse Bourgeois, Midwife to Mary de Medici."

WANTED.—Short-hand reporters. Must have a medical education. Address, with terms, Dr. W. B. Atkinson, 1400 Pine Street, Philadelphia.

OFFICIAL LIST

OF CHANGES OF STATIONS AND DUTIES OF OFFICERS OF THE MEDICAL DEPARTMENT U.S. ARMY FROM MAY 7, 1876, TO MAY 20, 1876, INCLUSIVE.

WEBSTER, W., SURGEON.—At expiration of his sick-leave assigned to duty as Post-Surgeon at Fort Warren, Mass. S. O. 85, Military Division of the Atlantic, May 9, 1876.

GODDARD, CHAS. E., SURGEON.—Assigned to duty as Post-Surgeon at Fort McKavett, Texas. S. O. 85, Department of Texas, May 12, 1876.

STERNBERG, GEORGE M., SURGEON.—To report to the Commanding General, Department of the Columbia, for assignment to duty. S. O. 92, A. G. O., May 11, 1876.

KNICKERBOCKER, B., ASSISTANT-SURGEON.—Ordered before the Army Medical Board, New York City, for examination for promotion, and, upon its completion, to report by letter to the Surgeon-General. S. O. 88, A. G. O., May 5, 1876.

HAPPERSETT, J. C. G., ASSISTANT-SURGEON.—Granted leave of absence for three months. S. O. 90, A. G. O., May 8, 1876.

WILLIAMS, J. W., ASSISTANT-SURGEON.—Assigned to duty as Chief Medical Officer of the expedition now being organized at Fort A. Lincoln, Dakota Territory. S. O. 63, Department of Dakota, May 8, 1876.

HUBBARD, V. B., ASSISTANT-SURGEON.—Assigned to duty at Alcatraz Island, California. S. O. 45, Department of California, May 4, 1876.

BREWER, J. W., ASSISTANT-SURGEON.—To accompany recruits from New York City to Department of the Platte, and, upon arrival there, report to the Department Commander for assignment to duty. S. O. 90, c. s., A. G. O.

MEACHAM, F., ASSISTANT-SURGEON.—Assigned to duty at Fort Brown, Texas. S. O. 77, Department of Texas, May 2, 1876.

DE WITT, C., ASSISTANT-SURGEON.—Granted leave of absence for twenty-one days. S. O. 63, Department of the South, May 12, 1876.

KIMBALL, J. P., ASSISTANT-SURGEON.—Assigned to duty as Post-Surgeon at Fort Brady, Michigan. S. O. 83, Military Division of the Atlantic, May 6, 1876.

MATTHEWS, W., ASSISTANT-SURGEON.—Assigned to duty at Camp Independence, California. S. O. 40, Department of California, April 20, 1876.

SHANNON, W. C., ASSISTANT-SURGEON.—Assigned to temporary duty at Fort Clark, Texas. S. O. 78, Department of Texas, May 3, 1876.